

(12)

EUROPEAN PATENT APPLICATION

(88)

Date of publication A3:

12.09.2001

Bulletin 2001/37

(51)

Int Cl.7:

F01L 1/24

(43)

Date of publication A2:

27.06.2001

Bulletin 2001/26

(21)

Application number:

00311527.6

(22)

Date of filing:

21.12.2000

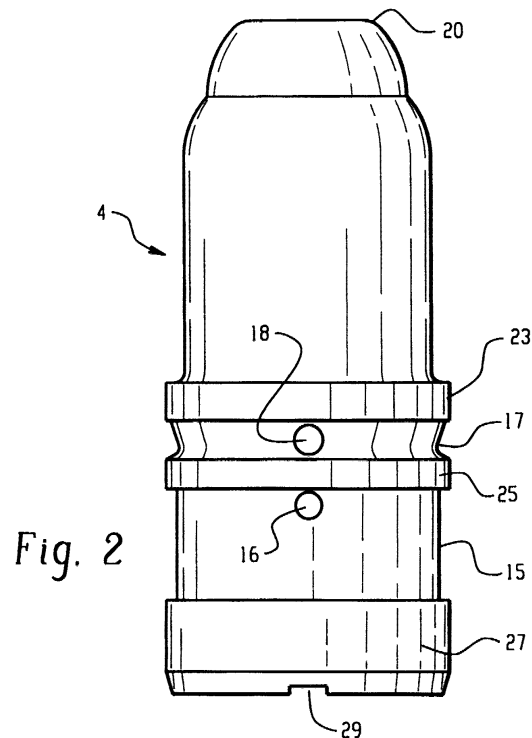
(84) Designated Contracting States: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR Designated Extension States: AL LT LV MK RO SI	(72) Inventor: Guzak, Michael James Battle Creek, Michigan 49015 (US)
(30) Priority: 22.12.1999 US 470713	(74) Representative: Burke, Steven David et al R.G.C. Jenkins & Co. 26 Caxton Street London SW1H 0RJ (GB)
(71) Applicant: EATON CORPORATION Cleveland, Ohio 44114-2584 (US)	

(54)

Hydraulic lash adjuster

(57)

A hydraulic lash adjuster (1) having a plunger assembly (3) including an upper plunger (4) and a lower plunger (5), the plungers being disposed within a body (2) defining a bore (2b,7), and in conventional leakdown plungers, cooperating with the bore to define a nominal diametral clearance. In accordance with one aspect of the invention, the plungers and the bore are provided with a reduced diametral clearance, substantially less than the nominal clearance, thus substantially improving the consistency of leakdown times. In accordance with another aspect of the invention, the upper plunger element (4) includes a center land (25) which defines a fluid passage (33), such as by having a flat (31) ground into the land, to insure the proper amount of lubrication fluid flowing out of the ball plunger (20).





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 31 1527

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 3 875 911 A (JOSEPH CHARLES) 8 April 1975 (1975-04-08) * column 1, line 3-42 * * column 2, line 2,3 * * column 4, line 8-13 * * figure 1 * ---	1,2	F01L1/24
A	US 4 524 731 A (RHOADS JACK L) 25 June 1985 (1985-06-25) * column 1, line 47-61 * * column 3, line 39-46 * * column 4, line 3761 * * figures 1,3,5-10 * ---	1,3	
A	US 4 788 947 A (EDELMAYER THOMAS C) 6 December 1988 (1988-12-06) * column 1, line 9-15 * * column 6, line 47-54 * * figure 2 * ---	1,2	
A	US 4 098 240 A (ABELL JR ROY F) 4 July 1978 (1978-07-04) * column 2, line 1-11 * * column 5, line 44-51 * * figure 2 * ---	1,2	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	US 3 670 707 A (GUIDO JURGEN) 20 June 1972 (1972-06-20) * column 1, line 6-20 * * column 3, line 35-45 * * column 4, line 43-56 * * figures 1,2 * -----	1,2	F01L
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20 July 2001	Examiner Paquay, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03 92 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 31 1527

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

20-07-2001

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3875911	A	08-04-1975	NONE	
US 4524731	A	25-06-1985	NONE	
US 4788947	A	06-12-1988	DE 3415889 A IT 1173829 B JP 59201907 A	31-10-1984 24-06-1987 15-11-1984
US 4098240	A	04-07-1978	NONE	
US 3670707	A	20-06-1972	DE 1912046 A	17-09-1970